

of data in the data area has not yet been completed and a value indicative that the data area is not permitted to be retrieved.

22. (currently amended) A data structure, stored on a storage medium, in a database, comprising:

a plurality of data areas in which given time series data pieces each for a constant time are loaded at predetermined locations, respectively, in said database, each of said plurality of data areas being located with data generated in time series during a certain time, the plurality of data areas being managed by the time series; and

predetermined bookmark information areas each having a pair of bookmark information indicative of a time at which said data is loaded in a time series data piece in each of said data areas and state transition information indicative of a state of the data piece in each data area, said state transition information having one of a value indicative of an online state in which the data area is permitted to be ~~retrieved~~ and retrieved, a value indicative of a loading state in which loading of data in each data area has not yet been completed and a value indicative that the data area is not permitted to be retrieved.

23. (currently amended) A database managing method for managing data in a database, comprising:

~~adding, to preparing~~ a predetermined location ~~for data in a given given time series data piece for series~~, each of said given time series having a predetermined constant time, time;

adding in each of said given time series of said predetermined location bookmark information having bookmark information indicative of a time at which said data is loaded in a time series data piece for said predetermined constant time for said predetermined time and state transition information indicative of a state of said time series data piece for said predetermined constant time;

providing, as said transition information, one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and a value indicative that the data area is not permitted to be retrieved and a value indicative of a state in which data in the data area is empty; ~~and~~

loading time series data pieces for predetermined constant times in empty areas of a plurality of data areas in said database said bookmark information having time data at which said time series data pieces are loaded, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series ~~series~~; and

deciding, in response to a request for time series data with a retrieval request time, to retrieve a time series data from said predetermined location when said retrieval request time is within a range of time indicated by a time data in said

bookmark information and not to retrieve when said retrieval request time is not within said range of time indicated by said time data.

24. (currently amended) A database managing method for managing data in a database, comprising:

~~adding, to preparing~~ a predetermined location for data in a given time series data piece ~~for series, each of said given time series having~~ a predetermined constant time, time:

adding in each of said given time series of said predetermined location bookmark information having bookmark information indicative of a time at which data is loaded in a time series data piece for said predetermined constant time and state transition information indicative of a state of said time series data piece for said predetermined constant time and start area information having a flag indicating whether the area is the final one of a plurality of areas in said database and an address area for setting an address;

providing, as said state transition information, one of a value indicative of an online state in which the data area is permitted to be ~~retrieved and~~ retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and a value indicative that the data area is not permitted to be retrieved;

loading time series data pieces for predetermined constant times in empty areas of a plurality of consecutive data areas in said database said bookmark

information having time data at which said time series data pieces are loaded, each of said plurality of consecutive data areas being loaded with data generated in time series during a certain time, the plurality of consecutive data areas being managed by the time series; ~~and~~ series;

raising said flag of start area information in the final one of said plurality of consecutive data areas and setting an address of first one of said plurality of consecutive data areas in said address ~~area-area~~; and

deciding, in response to a request for time series data with a retrieval request time, to retrieve a time series data from said predetermined location when said retrieval request time is within a range of time indicated by a time data in said bookmark information and not to retrieve when said retrieval request time is not within said range of time indicated by said time data.

25. (currently amended) A database managing method for managing data in a database, comprising:

reading bookmark information having bookmark information indicative of a time at which data is loaded in a time series data piece ~~for a~~ of a predetermined constant time and state transition information indicative of a state of said time series data piece for said predetermined constant time from a predetermined bookmark area and setting the state of said time series data piece in said state transition information to a value indicative of a state in which data is empty so as to write said bookmark information in said database; and

loading given time series data pieces for given predetermined constant times  
in empty areas of a plurality of data areas in said database, each of said plurality of  
data areas being loaded with data generated in time series during a certain time, the  
plurality of data areas being managed by the time series; ~~and~~ series;

writing bookmark information having bookmark information indicative of a time  
corresponding to a time series data piece ~~for~~ of said predetermined constant time  
and state transition information indicative of an online state of said time series data  
piece for said predetermined time in said predetermined bookmark area; and

deciding, in response to a request for time series data with a retrieval request  
time, to retrieve a time series data from said predetermined location when said  
retrieval request time is within a range of time indicated by time data in said  
bookmark information and not to retrieve when said retrieval request time is not  
within said range of time indicated by said time data.

26. (previously presented) A database managing method according to claim  
25, further comprising:

cumulating repeatedly applied time series data pieces in a cumulative storage  
area until the cumulative data reach total data for said predetermined constant time;  
and

adding, to a data piece in said cumulative data storage area, bookmark  
information having bookmark information indicative of a time at which said data is  
loaded in said data piece for said predetermined constant time and state transition

information indicative of a state of said time series data piece for said predetermined constant time and loading resulting data pieces in said plurality of data areas in said database, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series.

27. (currently amended) A database managing system, comprising:

a processor having a memory for storing data for a certain time and a clock for reading times at which said data are applied, the data in the memory being managed by time series; and

a database connected to said processor and having a bookmark information indicative of a time at which said data is loaded in a time series data pieces for a predetermined constant time, state transition information indicative of a state of said time series data piece of said predetermined constant time and said time series data pieces for said predetermined constant times, said state transition information having one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved and a value indicative of a state in which data in the data area is empty, wherein said processor comprises means for deciding, in response to a request for time series data with a retrieval request time, to retrieve a time series data from said predetermined location when said retrieval request time is within a range of time

indicated by a time data in said bookmark information and not to retrieve when said retrieval request time is not within said range of time indicated by said time data.

28. (currently amended) A data base managing method for managing data in a database comprising the steps of:

pointing, in response to a retrieval request requesting data ~~for~~of a constant time in time series between a first time and a second time, to a segment of a database which stores a data oldest in time series between said first time and said second time in a predetermined position in said database;

acquiring time information from a bookmark information residing at a predetermined position of said segment to obtain status information to determine whether said status information indicates a state of loading of data in said database;

seeking succeeding segments to find segments of time series after said first time based on bookmarks of said succeeding segments until a segment of time series at an end time series before said second time among said segments having status of loading; and

~~reading data from said segments found in the seeking step~~deciding, in response to a request for time series data with a retrieval request time, to retrieve a time series data from said predetermined location when said retrieval request time is within a range of time indicated by a time data in said bookmark information and not to retrieve when said retrieval request time is not within said range of time indicated by said time data.

29. (currently amended) A database managing system comprising:

means, in response to a retrieval request requesting data for a constant time in time series between a first time and a second time, for pointing a segment of a database which stores a data oldest in time series between said first time and said second time;

means for acquiring time information from a bookmark information residing at a predetermined position of said segment to obtain status information to determine whether said status information indicates a state of loading of data in a database;

means for seeking succeeding segments to find segments of time series after said first time based on bookmarks of said succeeding segments until a segment of time series at an end time series before said second time among said segments having status of loading; and

~~means for reading data from said segments found in the seeking~~  
means deciding, in response to a request for time series data with a retrieval request time, to retrieve a time series data from said predetermined location when said retrieval request time is within a range of time indicated by a time data in said bookmark information and not to retrieve when said retrieval request time is not within said range of time indicated by said time data.

30. (new) A database managing method according to claim 24, further comprising the steps of:



deciding, in response to a request to delete data from said plurality of consecutive data areas with a delete data time, whether said delete data time of said request is within a range of time indicated by a time data in said bookmark information; and

setting said state transmission information of said bookmark information to a state indicative of data empty.

31. (new) A database managing system according to claim 29, further comprising:

means for deciding, in response to a request to delete data from said plurality of consecutive data areas with a delete data time, whether said delete data time of said request is within a range of time indicated by a time data in said bookmark information; and

means for setting said state transmission information of said bookmark information to a state indicative of data empty.

32. (new) A database managing method for managing data in a database comprising the steps of:

preparing a predetermined location for data in given time series, each of said given time series having a predetermined constant time;

adding in each of said given time series of said predetermined location bookmark information having bookmark information indicative of a time at which data

is loaded in a time series data piece for said predetermined constant time and state transmission information indicative of a state of said time series data piece for said predetermined constant time and start area information having a flag indicating whether the area is the final one of a plurality of areas in said database and an address area for setting an address;

providing, as said state transition information, one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and a value indicative that the data area is not permitted to be retrieved;

loading time series data pieces for predetermined constant time in empty areas of a plurality of consecutive data areas in said database said bookmark information having time data at which said time series data pieces are loaded, each of said plurality of consecutive data areas being loaded with data generated in time series during a certain time, the plurality of consecutive data areas being managed by the time series;

raising said flag of start area information in the final one of said plurality of consecutive data areas and setting an address of first one of said plurality of consecutive data areas in said address area;

deciding, in response to a request to delete data with a delete data time, whether said delete data time of said request is within a range of time indicated by a time data in said bookmark information; and

setting said state transmission information of said bookmark information to a state indicative of empty of data.

33. (new) A database managing system for managing data in a database comprising:

means for preparing a predetermined location for data in a given time series, each of said given time series having a predetermined constant time;

means for adding in each of said given time series of said predetermined location bookmark information having bookmark information indicative of a time at which data is loaded in a time series data piece for said predetermined constant time and state transition information indicative of a state of said time series data piece for said predetermined constant time and start area information having a flag indicating whether the area is the final one of a plurality of areas in said database and an address area for setting an address;

means for providing, as said state transition information, one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and a value indicative that the data area is not permitted to be retrieved;

means for loading time series data pieces for predetermined constant time in empty areas of a plurality of consecutive data areas in said database said bookmark information having time data at which said time series data pieces are loaded, each

of said plurality of consecutive data areas being loaded with data generated in time series during a certain time, the plurality of consecutive data areas being managed by the time series;

means for raising said flag of start area information in the final one of said plurality of consecutive data areas and setting an address of first one of said plurality of consecutive data areas in said address area;

means for deciding, in response to a request to delete data with a delete data time, whether said delete data time of said request is within a range of time indicated by a time data in said bookmark information; and

means for setting said state transmission information of said bookmark information to a state indicative of empty of data.